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SOME OBSERVATIONAL TECHNIQUES FOR APPRAISING DEVELOPMENT, DRAWN PRINCIPALLY FROM THE NEW YORK CITY PROJECT.

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ON THE BASIS OF SEVERAL ASSUMPTIONS STEMMING FROM THE PRIMARY ONE THAT "INTELLECT IS DEVELOPED RATHER THAN INHERITED," OBSERVATION TECHNIQUES WERE DEVELOPED TO OBTAIN A MORE COMPLETE AND ACCURATE DESCRIPTION OF STUDENTS' CHARACTERISTICS AS LEARNERS, PARTICULARLY SINCE INTELLECT "OPERATES IN A CONTEXT OF EMOTION THAT (INTELLIGENCE) TESTS USUALLY DON'T INCLUDE," THAT IS, REFLECT. FOUR TYPES OF MATERIALS WERE DEVELOPED. "LET'S LOOK AT FIRST GRADERS" IS A TEACHER'S GUIDE DEVELOPED FROM PIAGET'S RESEARCH ON THE BEHAVIORAL SYMPTOMS OF INTELLECTUAL DEVELOPMENT AND FROM THE EXPERIENCE OF PRIMARY TEACHERS. IT YIELDS POSITIVE RATHER THAN NEGATIVE EVIDENCE OF LEVEL OF INTELLECTUAL DEVELOPMENT IN DESCRIPTIVE RATHER THAN SCORE FORM. A SECOND SET OF MATERIALS WAS DEVELOPED FOR USE ON "INVISIBLE" (SHY, WITHDRAWN) CHILDREN. ACTIVITIES ARE DESCRIBED FOR ELICITING BEHAVIORAL SYMPTOMS FROM SUCH CHILDREN. A THIRD SET OF MATERIALS IS A COMBINATION FIRST-GRADE CURRICULUM, INTELLIGENCE TEST, AND ACHIEVEMENT TEST COVERING 3 SCHOOL MONTHS. THE CALIFORNIA STATE DEPARTMENT OF EDUCATION'S "PROCESS FOR IN-SCHOOL SCREENING OF CHILDREN WITH EMOTIONAL HANDICAPS" IS A FOURTH OBSERVATION TOOL WHICH ESTIMATES THE DEGREE OF A CHILD'S ALIENATION (AS MEASURED BY TEACHER, PEERS, AND HIMSELF). IT CONTAINS MATERIALS APPROPRIATE TO PRIMARY, JUNIOR HIGH, AND SENIOR HIGH SCHOOL LEVELS. EXAMPLES OF THESE TECHNIQUES ARE APPENDED. THIS PAPER WAS READ AT THE UNIVERSITY OF GEORGIA TEACHER EDUCATION CONFERENCE (JANUARY 20, 1966). (AF)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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SOME OBSERVATIONAL TECHNIQUES FOR APPRAISING DEVELOPMENT

(Drawn principally from the New York City Project)

John E. Dobbin, (Educational Testing Service)

It will be wise for me -- and perhaps helpful to you -- if I state at the outset some of the personal opinions and prejudices that color my thinking, hence my remarks, about techniques for assessment of human development. The position from which I view intellect (intelligence), for example, can be described concisely in five parts. I believe:

1. That intellect is developed rather than inherited;

2. That it grows out of a small collection of biological reflexes which are pretty standard equipment among human infants everywhere;

3. That it grows as a consequence of interaction between the individual's developing intellect and his environment;

4. In a process composed simultaneously of assimilation of the environment by the ingellect and accommodation of the intellect to the environment;

5. If the steps in the assimilation and accommodation processes are very small and somehow related to what is already in the intellect.

This definition of intelligence is drawn largely from hypotheses advanced by Jean Piaget of Switzerland and modified or extended by J. McVicker Hunt and Jerome Bruner and others in this country -- though none of these distinguished people should be "blamed" for the deductions, which are mine. Reduced to the simple language that I use with myself when I think, what this definition means is that: For the practical purposes of helping children to learn, I regard intelligence as a learned skill rather than as an inherited characteristic. Whether this turns out to be 100% true when all the evidence is in does not concern me, for even if it is only 60% true it is an extremely useful working hypothesis from which to start any inquiry into intellectual development. It is my platform; from here I can operate. (And I suspect that it is going to turn out to be at least 90% true anyway.) So the first personal opinion I want you to know about as you listen to me is that I think intelligence is learned rather than inherited.

My second prejudice -- the one that probably is indirectly the reason for my being here -- has to do with the methods we use for appraisal of human development. I am referred to in the trade as a "measurement man"; I have worked for fifteen years in Educational Testing Service; the best known tools of my craft are the punched card and the standard deviation. Yet the single major gospel of my mission among educators is that to know people well enough to teach them we need to OBSERVE them as well as measure them. It seems to me that educational and psychological measurement have contributed importantly to our slowly growing science of

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pedagogy -- and they are likely to continue to do so -- but it also seems to me that in the burgeoning of measurement we educators have allowed our skills in observation to atrophy, our concern for total understanding of the individual to languish. The depth of our insight lessens, I believe, when we fall into the practice of only measuring people and not really LOOKING at them.

And this suggests the third personal opinion that shapes my point of view. Our present techniques in psychological and educational measurement fall far short of complete usefulness in assessing the effective or emotional context within which intellectual activity goes on. Only a few human beings have developed a capacity for thinking and acting -- part of the time -- in a wholly logical or intellectual context. The rest of us spend our lives acting and thinking in an emotional context -- spurred to action by emotional motivation, satisfied by emotional rewards, kidding ourselves now and then by rationalizing our conduct in intellectual terms, but seldom pulling ourselves out of the emotional soup in which we swim. And to the extent that our "measurement" of the intellectual characteristics of any human being neglects to take into account the sustaining fluid of emotion in which the human being is immersed -- to that extent the measurement is incomplete, unrealistic, and perhaps biased.

Putting all three biases together, we have the platform from which I view my topic: Intelligence is a learned skill which needs to be observed in action as well as "measured" because it operates in a context of emotion that tests usually don't include.

Enough of preliminaries. You all are as familiar as I am with young people whose intellectual skill -- demonstrated in their accomplishments -- is far greater than their test scores would lead anyone to suspect. You are also familiar with youngsters who seem to do a better job on tests than on anything else. What I am here to talk about is how educators can fill in around test scores with observational information -- to obtain a more complete and accurate picture of each student's characteristics as a learner.

My text and most of my illustrations are drawn from two major projects, one in New York City and the other in California. Each of these projects has an interesting background -- which is also a part of my narrative.

In the winter of 1963-64, the administration of the New York City school system sent a team of executives to visit my organization (Educational Testing Service) and discuss a problem that appeared to grow more pressing day by day. Most concisely, the problem was this: The techniques being used by New York City to test children -- hence, to group and organize them for instruction -- were quite obviously inappropriate for large numbers of children entering the schools. Since New York City had for years operated one of the most sophisticated testing programs in the country -- possibly one of the best programs -- this was a serious situation not only for New York but for everybody interested in appraisal of human development.

As is often the case, a non-educator helped to locate the center of the problem. In this case, it was the writer, Hillel Black, author of They Shall Not Pass,* who not only pointed out the problem but brought the newspapers and critics of the schools out in full cry. Black devoted a whole chapter to the classic example of one little girl -- Maria -- who illustrated the problem with tragic clarity. Maria was a small Puerto Rican immigrant whose performance on group tests of intelligence and

*Hillel Black, They Shall Not Pass. New York: Morrow, 1963, 342pp.

reading readiness in the primary grades yielded low IQ's and "readiness" scores so she was put into "slow learner" classes -- and kept there in spite of her teacher's efforts to explain to the school authorities that the child was quite bright in her own Spanish-speaking environment but was not yet very capable of handling problems posed in English. Her tragedy lay in being cast with dull children instead of being helped with English. The tests were not appropriate for the Puerto Rican child -- did not "fit" her -- because they presented her with problems in what was, to her, a foreign language.

To get the feel of how this might be if you and I were in a comparable position, let's try some analogies. Suppose we went someplace to apply for a job and the man said, "Take this test so I can see how bright you are and what you are qualified to do." And he handed us a test that looked like this. (Slide No. 1) How many in this group feel confident of being able to answer three out of five questions? They are easy for a Puerto Rican teen-ager with just a junior high school education!

Unfair, you say, because the questions obviously are in a foreign language. A poor example? Okay, try this one ... in English. (Slide No. 2) After you have answered the one common-sense question, look at the information about the question at the bottom of the page. More than half of high school seniors taking the College Board's Scholastic Aptitude Test get this one right -- I repeat: high school seniors.

Still unfair? You have more in the Brains Department than a test with content like this would let you show? It's in English, isn't it? And if bright high school seniors can do well with this kind of intellectual task, why should it be unfair for adults who have finished college? However, to show you that I'm not trying to discriminate against you -- and to see if there isn't <u>something</u> that you can do well in a test -- I'll give you one more chance to demonstrate how bright you are. (Slide No. 3) Since this one is based on a graph and requires almost no reading skill at all, I would expect you to answer four out of four correctly. Youngsters in the eleventh grade find this one quite easy -- if they have completed the PSSC course in physics.

Have I made my point? Do you feel that one of these three tests has a sufficiently good "fit" for you to be able to demonstrate on it how capable you are mentally? This is how I hoped you would feel -- for the three test pages you have just tried for fit are drawn from tests which are excellent instruments <u>for other people</u>; they don't happen to fit you because the language is not familiar to you and the problems are from an unfamiliar context. And yet, pencil and paper tests of all kinds are a far worse fit than this for nearly all young people in the group we call "disadvantaged."

Here, I am tempted to enter a strong plea. Please don't quote me as saying that tests are "no good." This is not what I have said or implied. What I have said is that even the best tests usually don't <u>fit</u> young people with cultural and educational handicaps -- thus don't let them show their intellectual skills. One doesn't say that a Scottish tweed suit is "no good" simply because it is a size 44 and looks peculiar on a teen-age bantam-weight.

And I <u>have</u> said or implied that almost all tests are built for use with people who have average, middle-class, white, literate -- backgrounds. Because this is true, young people who are above average in the cultural advantages their homes provide

and who are well educated nearly always knock the tops out of tests built for the mythical "average" youngster; in fact, a special series of tests -- the College Boards -- have been built just to provide tests that are difficult enough for these favored kids. At the other end of the line, young people who have less than the average in cultural resources and less than the average amount of schooling nearly always fall out the bottom of tests built for the average group. And this fact brings us face-to-face with one of the little-known truths of our time.

The "culture-free" and "culture-fair" tests of human ability that we hear about from time to time don't work very well, either. Work has not yet been completed on these kinds of instruments, but their trials so far have been disappointing; it appears that the whole circumstance of sitting down to take a test in a controlled situation is so utterly unfamiliar to culturally handicapped children that it makes no difference that the questions are about children like themselves rather than middle-class children. (Perhaps the recent work of Dr. Martin Deutsch has provided some new leads in this area).

Back to the New York City problem. If the best tests were inappropriate for use with large numbers of children entering the city's schools -- and they obviously were inappropriate for many children -- what were the schools to do?

Clues to one kind of answer lay all around -- in the work of modern researchers, in the comments of teachers, even in the chapters of the writer who had triggered the chain-reaction of criticism, Hillel Black. These clues all pointed toward the teacher. Could teachers somehow observe a child with sufficient validity to provide useful estimates of his intellectual development? Dr. Deutsch was already at work on an extensive research project in which a few teachers were being trained as specialists in "intervention" for the sake of the culturally-different children; but could all primary teachers in a massive school system be taught enough of the rudiments of "child-watching" to permit them to estimate intellectual development realistically? It was thought to be worth a try.

One small item of history might be interesting here. Precisely at the time when it was decided to press ahead experimentally with a program of in-service teacher training, the Board of Education in New York City outlawed the IQ! No more tests yielding IQ scores were to be used; IQ scores were to be expunged from the records of students. "If the IQ is all that bad," the Board said, in effect, "let's get rid of it now." Which was a sudden way of making "honest girls" of all of us by burning the bridges behind us. And it made quite a stir in the newspapers.

The content for a system of child-watching in which teachers could be trained was developed from two sources simultaneously: from the research of Piaget (to provide a unifying theory of development) and from the experience of primary teachers themselves.

From Piaget was borrowed the hypothesis that intellect develops sequentially through stages that have pronounced characteristics in behavior which can be observed. Piaget's "stages" are fairly gross in the number of years each covers (ages 2-6, for example, for some of them) and they overlap and stretch and telescope, but they are nevertheless useful in digging a toe-hold for useful observation of children. Let me give you a couple of examples.

According to Piaget's observations, a child is passing one of the important milestones in his growth toward logical thought when, at least some of the time, he applies the principle of conversation of quantity. It goes like this: (Slide No. 6) Show the child two identical jars filled with water, A and A-prime. Talk about their equality; pour the water from one into the other to demonstrate their equality in volume. Then pour the water from Bottle A into Bottle B, which will hold exactly the same volume of water but has a different shape. Do the pouring while the child watches or have him do it. Now ask him which of the two bottles (B or A-prime) holds the more. If he has reached this particular milestone in his intellectual growth, the child will either say that both bottles hold the same amount -- or express his contempt for such an obviously stupid question. If he has not reached this point in development, he is likely to say that Bottle B holds more because it is "fatter" or that Bottle A-prime holds more because it is taller.

Another of Piaget's "milestones" in development of the intellect is reached when the child is able -- at least some of the time -- to put himself in another person's place and see things from another point of view. (Slide No. 8) Here we have two children, on opposite sides of an easel, drawing the same object. Child A sees that object with the tallest stick on the left. Child B sees it with the tallest stick on the right. Until Child A has reached this particular milestone in her development, she literally cannot draw "how the sticks will look to Child B" -- not even if she is allowed to walk around to the other side of the easel for a peek. Until she reaches this milestone, she can draw only what she perceives and cannot represent to herself the probable perception of somebody else.

These have been but two of the many "symptoms" of intellectual development observed by Piaget among children in the age range of four to eight years. His research was combed for others, to the end that a list of behavioral symptoms of intellectual development might be compiled. This became known by the project staff as the "Piaget List."

At the same time as the study of Piaget's research (winter and spring of 1964), teams of interviewers went to visit the teachers of kindergarten and the primary grades in New York City. Without mentioning Piaget or any theoretical framework for the inquiry, teachers (mostly in small groups around coffee and cigarettes) were asked simply: "What symptoms of intellectual development have you seen in individual children?" Once they recovered from the shock of the question -- who ever heard of an "expert" asking a teacher's opinion about anything? -- they literally poured out anecdotes about and illustrations of child behavior which they interpreted as positive evidence of growing intellectual skill. One anecdote will illustrate.

"Charlie," said one teacher, "earned a Binet IQ of less than 70 and fell out the bottom of the reading readiness tests .... BUT ... I know for a fact that once a week Charlie gathers up the family wash, catches the right cross-town bus (in New York!) to reach the cheapest laundromat, uses all the proper coins and pushes all the proper buttons to buy detergent and wash and dry the clothes, and returns home by bus in the rush hour ... and don't anybody try to tell me that Charlie is stupid!"

The collection of these anecdotes from several hundreds of New York City teachers became the "Teachers' List." It contained "symptoms" of intellect as revealed in the behavior of youngsters in music, in art, on the playground, in group activities, in isolated endeavor -- as well as in the more academic activities of "school." The list contained several hundred separate items. And one of the exciting things

about it was that when it was finally compared with the Piaget List, the Teacher List could be fitted into the Piaget List almost without an exception! This fact needs emphasis: The behavioral symptoms of intellectual development, as seen by New York City Teachers in children from deprived cultures, fit rather neatly into the hypothetical categories of a Swiss researcher who has been looking at Swiss and French children of the middle class! In other words, the Teachers' List could be defined as "Piaget expressed in the language of Harlem and Brooklyn Heights."

Such a discovery could lead only to one conclusion: The teachers do see important symptoms of intellect in young children. And this conclusion led to the next step in the project. If at least some of the teachers are already seeing some of the critical signs of intellectual development in some children, perhaps a program of systematic instruction would help most of the teachers to see some of the symptoms in most of the children.

Using the Teachers' List almost entirely (and still keeping Piaget and his technical nomenclature out of sight) a preliminary guide for teachers was prepared and assigned for experimental use by primary grade teachers in one school in each of the city's twenty-five districts. A couple of pages might illustrate what that guide was like. (Slide No. 4) Read the paragraphs in the middle of the page and the behavioral "symptoms" that follow. Teachers in some neighborhoods were quick to point out that immigrant families from Puerto Rico were likely to have different perceptions of some of these family terms -- that many Puerto Rican children will have several "uncles" around the home but no "father," and so on.

(Slide No. 5) Here is a set of behavioral symptoms in another category -- that of listening comprehension.

If you were to see more than just two pages of this guide, you would be struck by the fact that all of the behavioral symptoms listed are positive evidence of intellectual development. There are NO negative symptoms anywhere in the guide. The teachers whose contributions made the guide possible stressed this point. "We are sometimes able to see evidence that a child has reached a certain milestone in his development, but we never can be certain that he has not reached that milestone." Hence the process of observation being developed in New York City concentrates on positive evidence. The teacher who uses it well can say either of two things about a child:

1) "I know that Fred has reached this point in development because I have seen him do this and this and this ...." OR

2) "I don't know what level of development Fred might have reached because I have not seen him exhibit any really symptomatic behavior."

And, of course, this point of view represents a major change in habit among educators. Imagine -- a teacher not making a negative judgment about the intellectual development of a slow-learning child!

The teachers' guide was used last year by about 100 teachers in 25 schools in New York City -- and was revised by them in the light of their experience with it. This year it is being used by four times as many teachers and schools, and will be revised again. Next year it will be used (I think) in all kindergarten and first grade classes in the city. Its name is Let's Look at First Graders: A Guide to Understanding and Fostering Intellectual Development in Young Children. *(I'll

tell you later how you can buy a copy if you can't live without it.)

To answer here a question that may have begun to bubble to the surface of your mind -- What kind of a score does the teacher-observation yield? -- it doesn't yield any score at all. The system takes cognizance of the fact that even at age six human beings are terribly complex creatures who simply cannot be summarized into a set of digits. The system is satisfied, therefore, if the teacher is able to describe some of the learning characteristics of each child in a way that will help her to understand him better and teach him better. What does anyone really need a "score" for, anyway?

The project has second and third facèts. As nearly everyone anticipated, the teacher's guide didn't work with some children -- notably with those kids who do their best to remain "invisible" in the strange environment of the classroom -- the shy children, the withdrawn ones, the potentially disturbed ones. These are the children who are not "seen" by the teacher because they don't do anything; they reveal no behavioral symptoms of anything. How should the teacher get at them?

A second set of materials (which still don't have a name that will stick) was developed for use with such children. In essence, these materials describe activities which can be used to draw out the withdrawn kids, to lure them into activities in which they will exhibit symptomatic behavior. The problem of the bottles from Piaget is one of them -- it has many variants as a game. (Slide No. 12) Another is an activity involving arrangement of simple pictures according to a logical time sequence. (Slide No. 13) Here is a reversible sequence idea that can be demonstrated non-verbally. There are activities and materials easily "come by" in every school -- balance beams and sorting games and water sports with mason jars -- described so that the teacher can use them to lure the less visible children into involvement that will let them reveal their intellectual development. All these ideas are bound up in a little experimental manual for teachers entitled: "Instructional and Assessment Materials for First Graders." This manual is one year behind the teacher's guide in the experimental process, so it is comparatively rough -- a first draft to be revised at the end of this school year.

The third (and final) set of materials being developed in the New York City project is also in its initial year of try-out. It resembles a "test" more than either of the other two sets of material. What it really is -- is a combination first grade curriculum and intelligence test and achievement test three months in length. In part, it works like this:

(Slide No. 17) Here is a little printed folder of exercises in number function. In the illustration, the child is asked to mark the picture having MORE apples, FEWER peanuts, MORE turtles, MORE money -- and the other pages in the folder continue the same exercise. Different booklets repeat the same kinds of exercise in perception of MORE and FEWER each day on Monday through Thursday. Following the exercise each day there are activities suggested for re-inforcement. When the exercise is given in its fifth version (on Friday) it is treated as a test and the child's success with the task is noted. Here is another: (Slide No. 18) This is the booklet for the third day in the sequence on logical reasoning. The directions read: "In the first game, the owner of a pet store wants to put the fishes of different colors into separate tanks. The small color circles on the top of the tanks tell him the color of the fish which belongs in each tank. There is a light circle, a dark circle and a black circle. You can see that the dark fish and the black fish are where they belong, but there is one empty tank. Can you find the fish that belongs in the empty tank? That's right. The light colored fish has a big X on it because

it belongs in the tank with a light circle above it. Now, let's try the next game together ...."

In this series of experimental materials there are sets of five exercise booklets and suggestions for daily follow-up instruction in each of six different learning areas:

1) Shapes and forms

2) Spatial relations

3) Time concepts

4) Understanding mathematics

5) Communication skills

6) Logical reasoning

All of these are managed and applied through use of a "Manual of Directions for Written Exercises for First Graders." And if you ask me whether I think this is testing or teaching, I'll answer "Both!" and challenge you to tell me why the two things should have to be kept separate.

In summary of the New York City project to date: You have had a glimpse of three different but related techniques being tried out in the hope of being able to teach first grade teachers to see the intellectual characteristics of their pupils by means of systematic observation. If educators can break some of the habits they have built in forty years of "measurement" -- habits of dependence on such notions as inherited intelligence, the stable IQ, the reliability of test scores, and all the rest -- perhaps this or a similar technique for observation will help teachers toward a deeper insight into individual learner's problems. That, quite simply, is the goal of it all.

New York City quite wisely printed extra copies of all the experimental materials on this second go-'round -- and asked ETS to distribute them to interested educators at the cost of printing. Write to Dr. S. Donald Melville at Educational Testing Service, Princeton, N. J., 08540, for a price list and ordering information.

The New York City project has been my major focus here, but I need at least to mention the Process for In-School Screening of Children With Emotional Handicaps as a second major technique for assessing the characteristics of human development by observation.

In the introduction of this paper (my third personal opinion) I said that, for most of us, all intellectual activity is carried on in an emotional context. If this is true, then the emotional context in which the individual does his school learning must be terribly important -- so important as to control whether that individual learns in school or not. Researchers in this field reach various conslusions, but taken as a whole the available evidence indicates that ten to twenty-five per cent of children in school are seriously handicapped in school learning by shortcomings in emotional adjustment.

It follows (if one accepts these initial ideas) that the teacher who has some "feel" for the emotional environment a child perceives the classroom to be -- will

have a better chance to "reach and teach" that child. Further, if a child is seriously disturbed (alienated from his environment), the earlier he can be identified and brought to professional help the greater is the chance that he can be brought back to mental health.

Now available as experimental tools for use in bona fide research programs is the series of instruments in the "Screening Process" I mentioned. Developed by Bower and Lambert on combined grants from the U. S. Office of Education and the California State Department of Education, here is a series of techniques for estimating the degree of alienation of a child by observation. The technique combines the observation of the child by his teacher with observation of the child by his peers and observation of the child by himself. This is done ingenuously and quite simply in a process that teachers can learn to handle well in a short time.

No child gets a "tag" hung on him in the Bower-Lambert process. (I've always resented my own classification as an introvert when at heart I am a fearsome swashbuckler.) Rather, if a child in this process is perceived as alienated -- "different" -- by two out of the three sources of perception (self, peers, teacher) he is simply identified as one who should be looked at more closely by a trained observer like a psychologist.

There are materials in the California set appropriate for "screening" work by classroom teachers at three levels: primary grades, junior high school, senior high school. I mentioned them even thus briefly because, like the New York City techniques, they depend upon the trained observation of pupils by classroom teachers.

What does all of this add up to? I think it adds up to this: We in education have reached a point of diminishing returns in formal "measurement" of the young people whom we teach. Much of the measurement we use is good -- but we need to add to it a great measure of just looking at our students as learners. The New York City project and the California screening process are only first and faltering steps in this direction.

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A P P E N D I X

(Slides as referred to in lecture)

No tenía suficiente dinero para salir de apuros; sólo contaba con lo que producían los campos. Y completamente solo, ocultando a la familia su situación, siempre teniendo que sonreír cuando estaba con su mujer y sus hijas las cuales le recomendaban que no se esforzase tanto, el pobre Sánchez se entregó a la más frenética locura del trabajo. Se olvidó del sueño. Quiso cultivar todas las tierras y hasta trabajaba de noche. Si su familia estaba ciega, en las cabañas vecinas bien adivinaban la situación.

Lo peor era que a pesar de sus esfuerzos sólo podía pagar una pequeña parte de su deuda. Los resultados de este exceso de trabajo no se demoraron mucho. El rocín, cansado de trabajar de día y de noche, expiró sin permitirse el menor intento de rebelión contra su pobre amo.

29 ¿A qué se dedicaba Sánchez?

A A la antropología
B A la alfarería
C A la labranza
D A la arboricultura **29**.....

30 ¿Cómo actuaba Sánchez delante de su familia?

A Fingía estar dichoso.
B Se quejaba sin cesar.
C Se entristecía mucho.
D Se desmayaba de cansancio. **30**.....

31 ¿Qué actitud tenía la familia de Sánchez?

A Estaba enterada de la situación.
B Ignoraba la gravedad de la situación.
C Le recomendaba que trabajara más horas.
D Le sugería que vendiera los campos. **31**.....

32 ¿Qué ocurría en casa de los vecinos de Sánchez?

A Ignoraban la verdad.
B Ofrecían prestarle dinero.
C Le maldecían y le maltrataban.
D Se daban cuenta de sus apuros. **32**.....

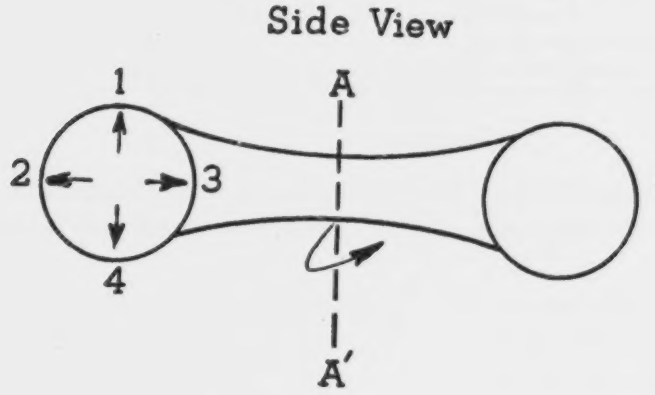
33 ¿Con qué culminó la situación del pobre Sánchez?

A Con la ida de su criado
B Con la muerte de su caballo
C Con la amortización de sus deudas
D Con que la familia se enteró de lo que pasaba **33**.....

2

Question 17

One method of obtaining "artificial gravity" in a space station is to have the station rotating about axis AA′ as it revolves around Earth.



The inhabitants of the space station would call which direction "down"?

(A) Direction 1
(B) Direction 2
(C) Direction 3
(D) Direction 4
(E) Any one of the four, depending on speed of rotation

Statistical Analysis

RESPONSES	Students Classified by Total Test Score				
	LOWEST FIFTH	NEXT LOWEST FIFTH	MIDDLE FIFTH	NEXT HIGHEST FIFTH	HIGHEST FIFTH
Omit	3		1		
A		1		1	
*B	12	17	19	29	28
C	8	4	6	1	
D	7	9	6	3	6
E	4	3	2		
Total	34	34	34	34	34

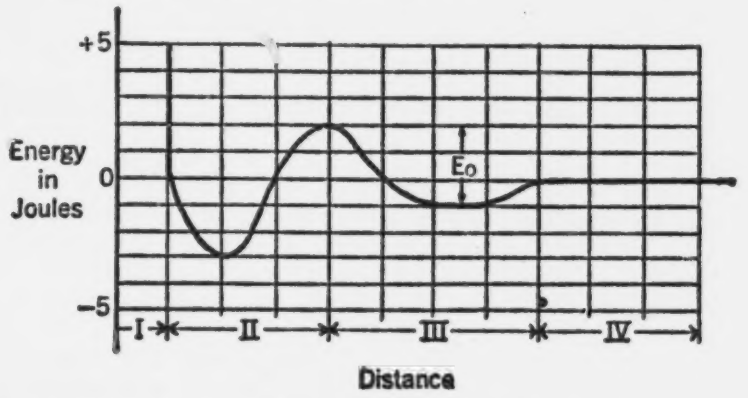
Per cent of total group of 170 students answering correctly 62%
Correlation between success on this question and total score on test .44

*Correct answer

3

Directions: Each of the questions or incomplete statements below is followed by five suggested answers or completions. Select the one which is best in each case and blacken the corresponding space on the answer sheet.

Questions **17-20** relate to the following graph and information:



The graph shows the potential energy of a particle as a function of the horizontal component of its distance from some point ***0***. The horizontal line continues indefinitely to the right. Use Newtonian mechanics throughout.

17 A particle having a total energy of –2 joules may possibly be found in Region

A III only.
B II only.
C II or III.
D I or III.
E IV only.

18 A particle free to move in Region II has been at rest there for some time. The energy that must be given to it if it is to go from Region II to Region III is

A equal to E_0 because of the conservation of energy.
B equal to E_0 because the particle is at rest in either region and therefore has zero kinetic energy in each region.
C less than E_0 because the particle at rest in Region II has less energy than when at rest in Region III.
D more than E_0 because the particle at rest in Region II has less energy than when at rest in Region III.
E less than E_0 because momentum must be conserved.

19 A particle free to move in Region II has been at rest there for some time. Which of the following is the minimum energy that must be given to the particle to get it into Region IV? (Hint: the particle will not be at rest in Region IV.)

A 2 joules
B 3 joules
C 4 joules
D 5 joules
E 6 joules

20 A particle having zero total energy when it is in Region II

A also has zero potential energy.
B has a maximum kinetic energy of +2 joules.
C has a maximum kinetic energy of –2 joules.
D has a maximum kinetic energy of +3 joules.
E has a maximum kinetic energy of –3 joules.

GO ON TO THE NEXT PAGE

Draw or build different-sized houses or garages and match them to different-sized people or cars. 2F04

Match things which differ along *separate* dimensions—the lightest shade of paint for the shortest child, for instance. 2F05

DEVELOPMENTAL TASK

The simple matrix of two dimensions. The child can construct a simple matrix differing along two dimensions. 2F51

Mutual or complementary relationships are much more difficult for the child to grasp because they often do not involve any tangible comparison. The young child may know perfectly well that John is *his* brother, but has great difficulty in understanding that *he* is John's brother.

While genuine understanding of mutual and complementary relationships is usually not attained until middle childhood, the following are signs that the child is developing such an understanding.

In answer to *direct questions* or in *spontaneous behavior*, the child shows that he:

Understands he is a brother or sister to his own siblings. 2G01

Includes or counts himself in the total pool of brothers and sisters in the family. 2G02

Realizes that there must be at least two people involved and shows some understanding of their relationship when he uses such terms as "brother of," "friend of," or "enemy of." 2G03

Can correctly identify his own right and left. 2G04

Can correctly identify the right and left of someone opposite him. 2G05

LISTENING COMPREHENSION

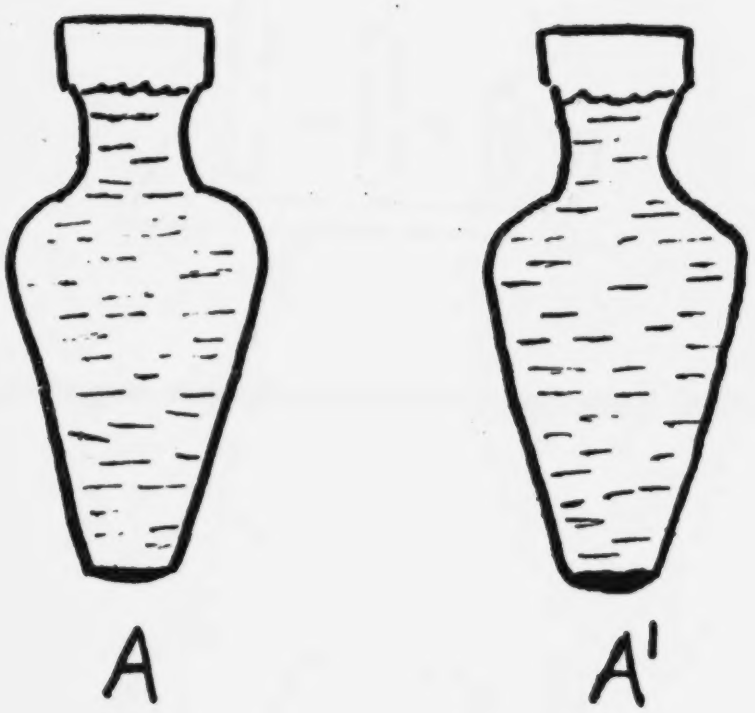
15

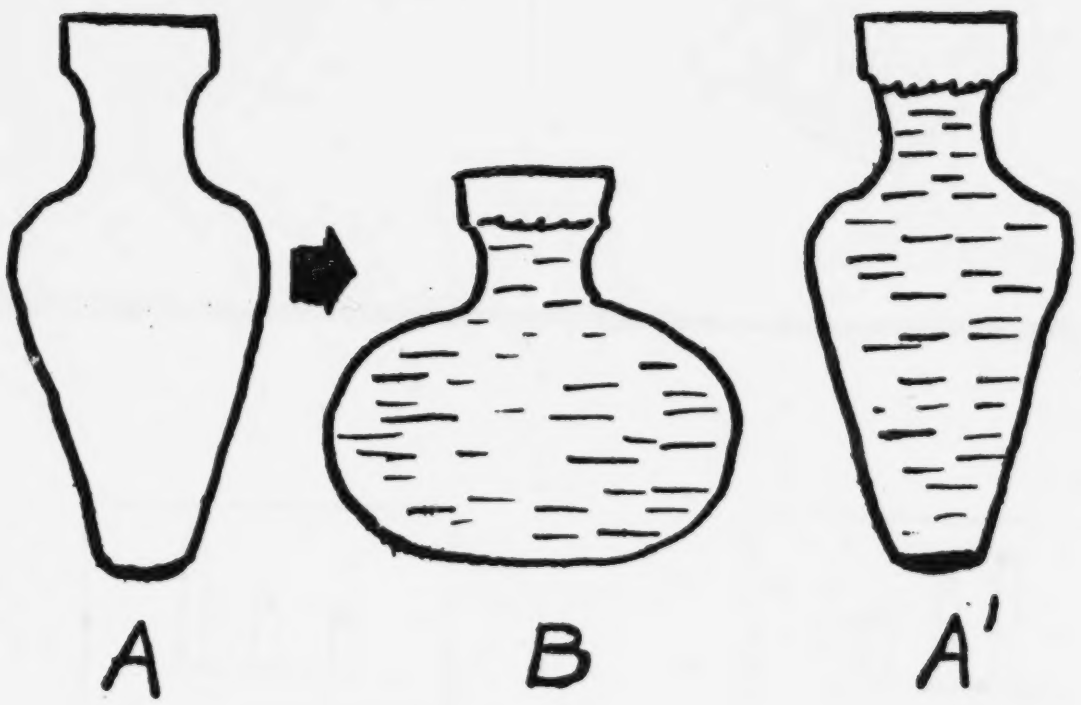
Until a few years ago, listening was an act we took almost as second nature. Now, however, we know that listening is actually one of the most complex of human acts, involving many learned skills. While our understanding of these component skills is still in the infant stage (over 90 percent of the listening research has been conducted since 1952), we do know that such factors as auditory discrimination and attention are vital to the over-all listening process. Most primary grade teachers, for instance, have long been aware of children who cannot discriminate well among the sounds of our language and who, therefore, cannot take full advantage of instruction in phonetic analysis.

Because listening is so crucial to learning, the teacher must be sensitive to the child's developing ability in this area. The following are examples of behavior that reflect *over-all ability to listen with comprehension.* (Indications of auditory discrimination and attention skills will be discussed on the following pages.)

The child demonstrates listening comprehension when he:

Follows complex verbal directions in English—the directions may be given either by the teacher or another child.	4C01
Follows complex verbal directions given in another language or dialect.	4C02
Is able to get the "gist" of directions by a combination of listening and imitating the behavior of other children.	4C03
Follows simple directions in craft activities.	4C04
Follows directions in songs or games.	4C05
Draws inferences about the meaning of words from their context or from the tone of voice and gestures of the speaker.	4C06
Retells a story, getting main ideas in the proper sequence.	4C07
Retells a story in proper sequence by drawing it in pictures or by acting it out in a play or with puppets.	4C08
Anticipates the ending of a story or what comes next.	4C09
Asks pertinent questions before the teacher gets to the end of what he is saying.	4C10
Laughs at the right time when a story is read.	4C11


A
A'


A
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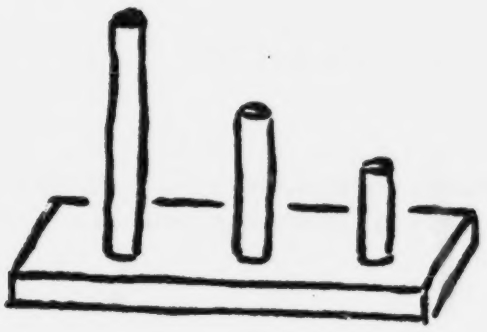
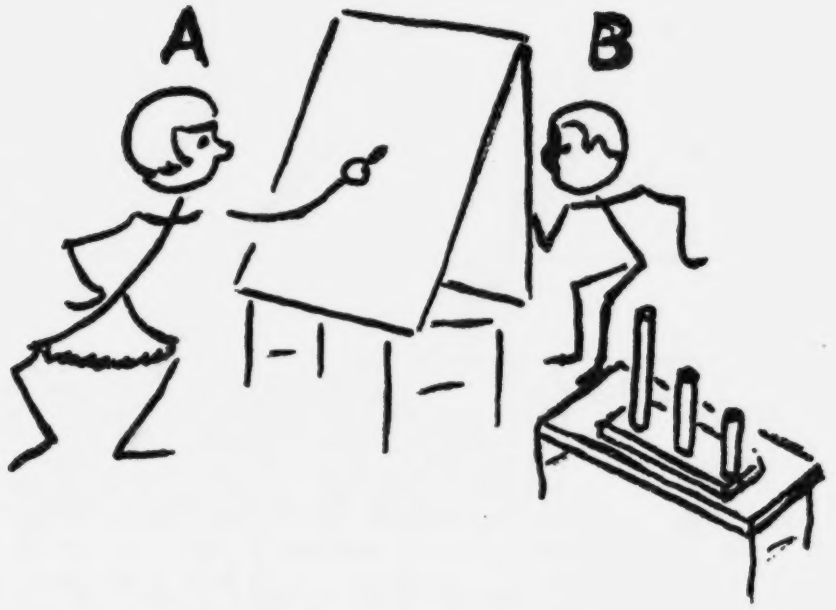
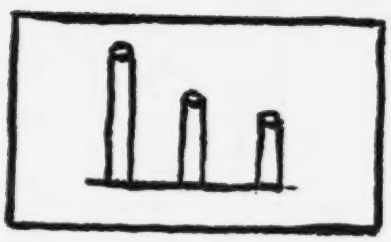
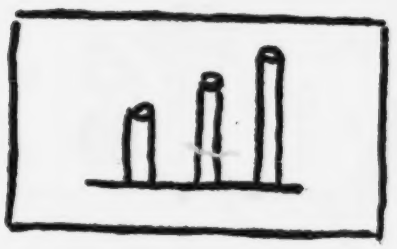






A



B

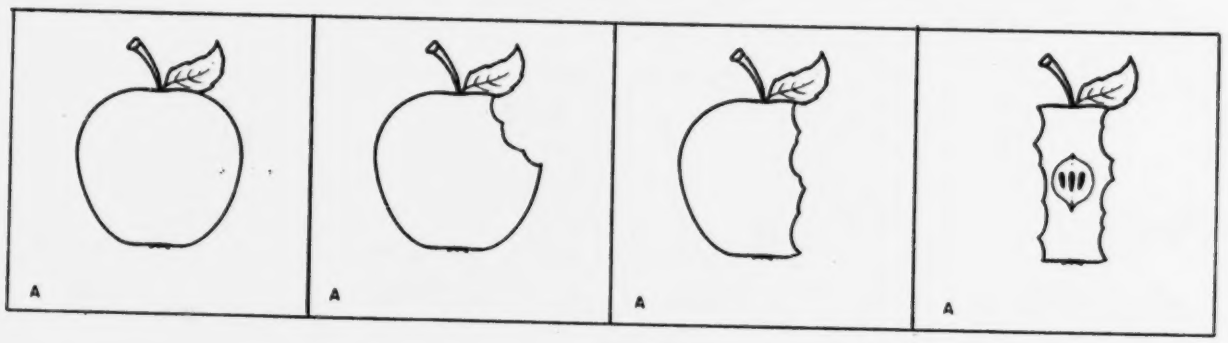
12

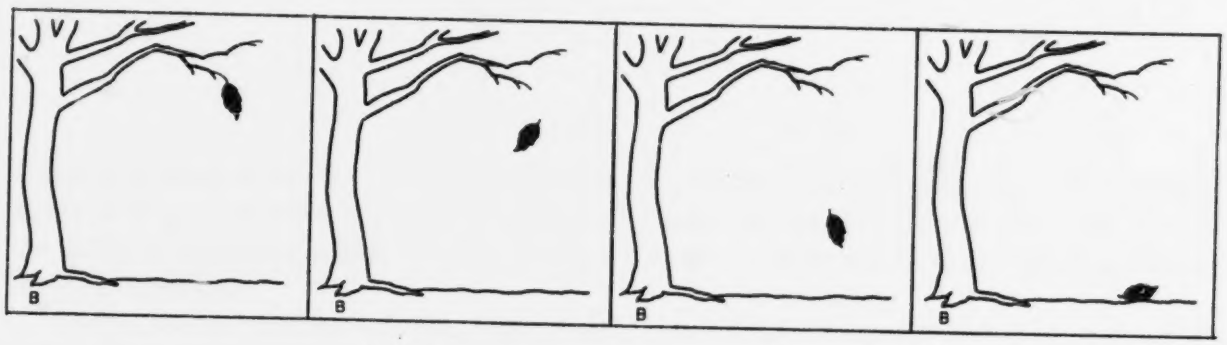
SEQUENCE CARDS

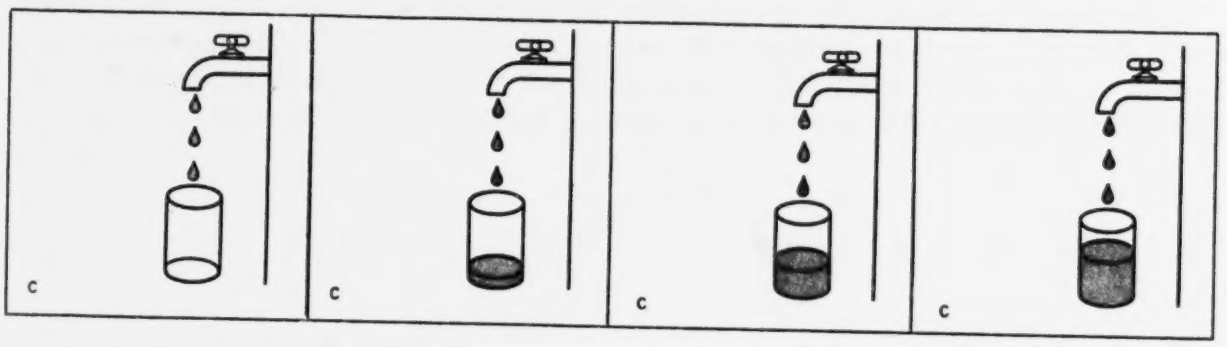
OBJECTIVES: to provide an activity which helps children to think logically about various sequences of events . . . to stimulate interest in observing what happens over a short or long period of time.

DESCRIPTION: There are ten sets of small cards for each student and a duplicate set of large cards for the teacher. Each set consists of four cards showing various kinds of sequences. The child's task is to put the cards in correct order to "tell a story." The ten sets of cards differ somewhat in nature, purpose, and difficulty level, as described below.

Short Term Sequence: Sets A, B and C help children observe detail and gain understanding of the logical, irreversible order of certain kinds of events.



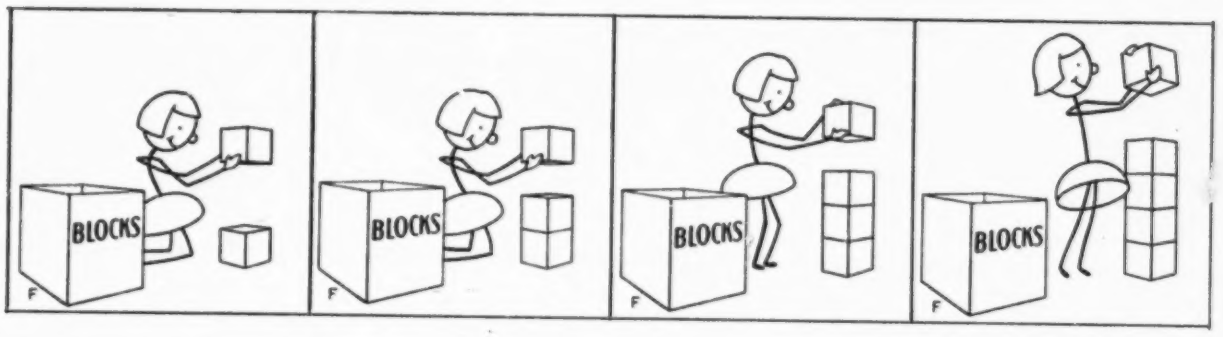


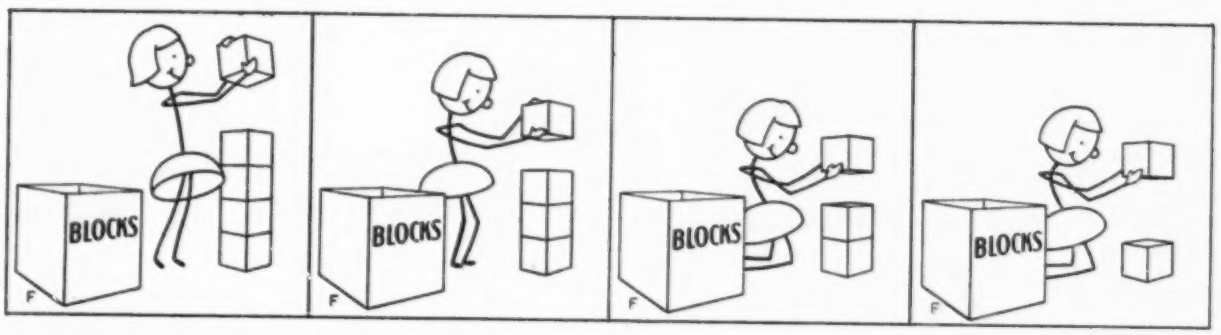


13

SEQUENCE CARDS (Continued)

Reversible Sequences: Set F helps children grasp the value of using verbal symbols to interpret an ambiguous event. The girl may be either building a tower of blocks *up* or taking them *down*. The child cannot logically determine *any* proper order without naming the kind of transformation that is taking place. Only by using words can he organize the pictures in a meaningful way.





Reversible Sequences: Set G, like the previous one, is deliberately ambiguous. The emphasis again is to get the child to label the action or change he thinks is taking place. In this set, the group of pigeons to the left of the trash basket may be interpreted as getting progressively *larger* or *smaller*.

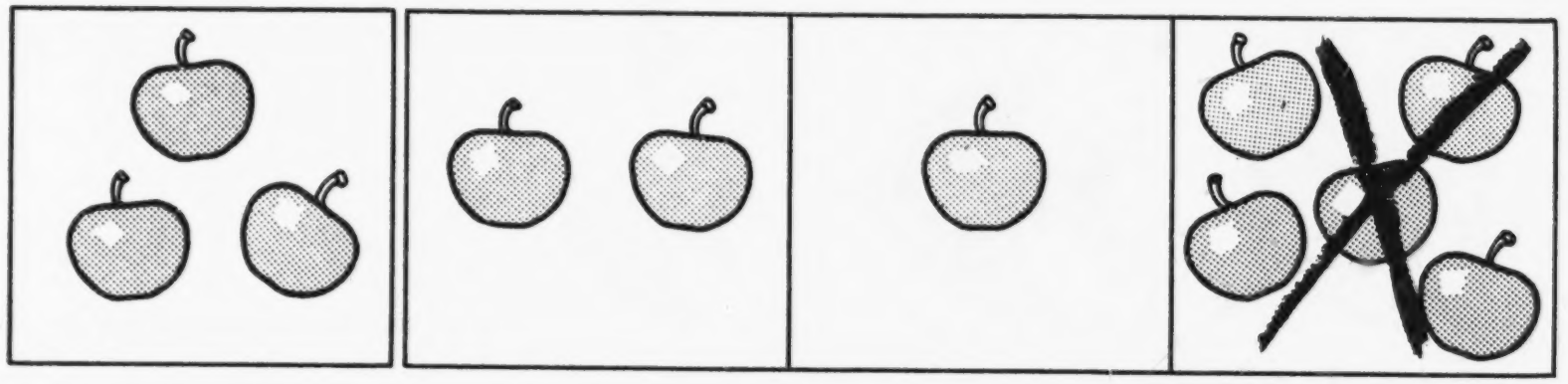
At first, all the pigeons may be congregated to the left of the basket and then some of the pigeons go over to the right. Or, the reverse interpretation may be made: the pigeons start out in equal groups and move over to the left so that all the pigeons are on the left side.

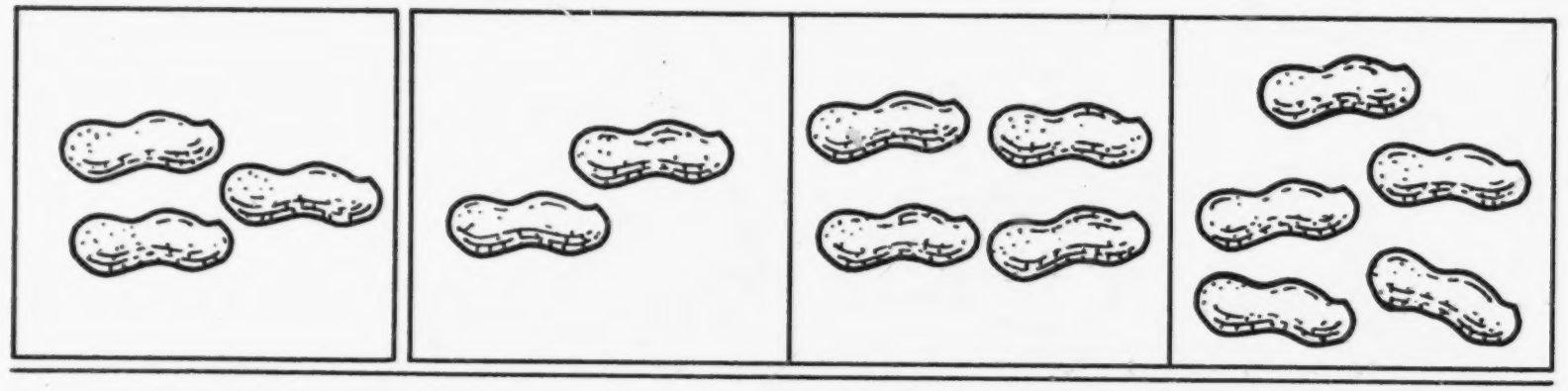
Presumably, these pictures could also be arranged randomly in some order other than those shown here. If the pigeons are not going progressively from left to right or right to left, however, the child should be asked to come up with some other explanation for their actions.

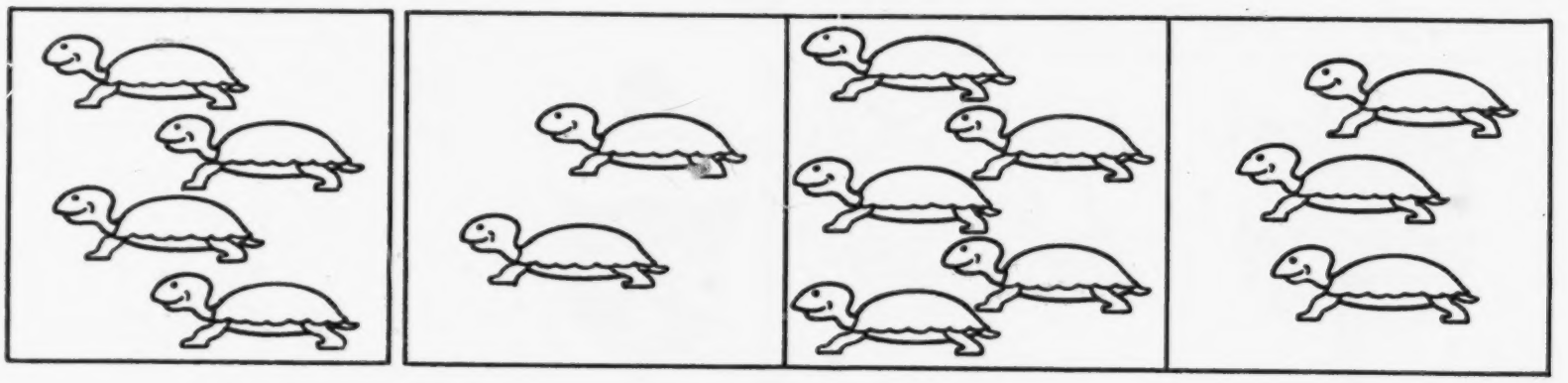
NAME_____

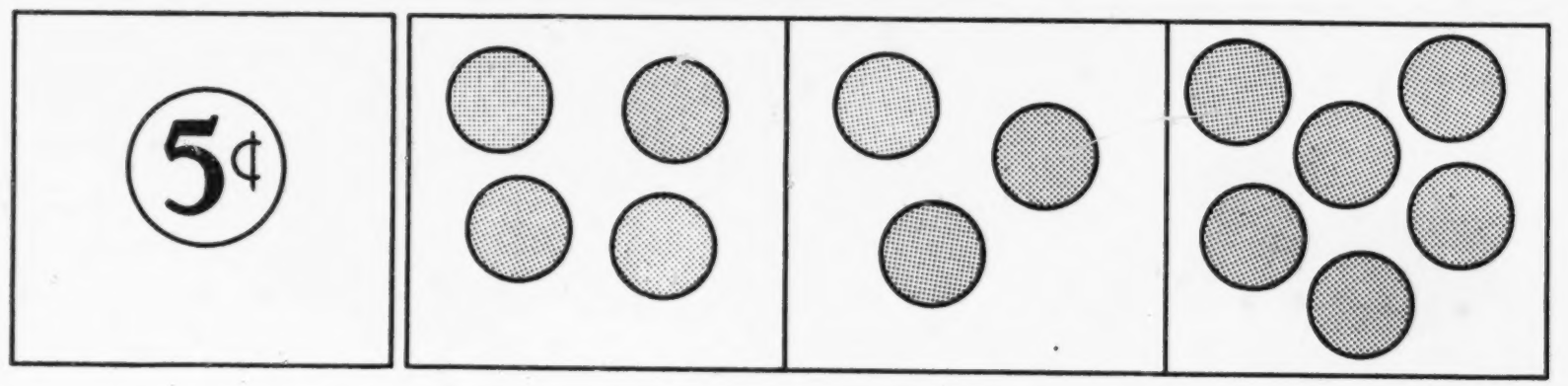
17

UNDERSTANDING MATHEMATICS









NAME_____

18

LOGICAL REASONING